

Applicants : Artemio Affaticati and Claudio Cerutti
For : HIGH RATE INDUCTION SYSTEM
Preliminary Amendment : March 9, 2004
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The listing of the claims will replace all prior versions and listings of claims in the application:

LISTING OF CLAIMS:

Please cancel claims 1-15, 34-57, 68-82 and 99-120 without prejudice.

1-15. (cancelled)

16. (original) A sortation system, comprising:

a sorter including a continuous member defining a plurality of transport positions of said continuous member;

a plurality of sort destinations for receiving product discharged from said continuous member;

an induction system comprising at least two induction units, each of said induction units having a receiving end for receiving product from a product source and a discharge end for discharging product to said continuous member; and

a control determining gap between product that will be discharged to said continuous member, wherein at least one of said induction units is capable of discharging product to said continuous member irrespective of gap between product.

17. (original) The sortation system in claim 16 wherein another of said at least two induction units decreases in speed in response to said at least one of said induction units discharging product to said merge irrespective of gap between product.

18. (original) The sortation system in claim 17 wherein said another of said induction units performs an activation sequence after decreasing in speed.

19. (original) The sortation system in claim 16 including a recirculation line from said continuous member to said receiving end of one of said induction units for recirculating product discharged to said merge with insufficient gap between the product.

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20. (original) The sortation system in claim 19 wherein said control monitors a proportion of product in recirculation.
21. (original) The sortation system in claim 20 wherein said at least one of said induction units discontinues discharging product to said merge irrespective of gap if the proportion of product in recirculation exceeds a particular level.
22. (original) The sortation system in claim 19 wherein said recirculation line substantially excludes product accumulation.
23. (original) The sortation system in claim 22 wherein said recirculation line comprises substantially only belt conveyors.
24. (original) The sortation system in claim 16 wherein each of said induction units includes a plurality of tandem conveying units between said receiving end and said discharge end.
25. (original) The sortation system in claim 24 wherein said control books at least one transport position for receipt of product from either of said induction units.
26. (original) The sortation system in claim 25 wherein said control books a transport unit for a product when that product is at a booking conveying unit and adjusts relative spacing between product and the respective transport position booked for that product on ones of said conveying units downstream of said booking conveying unit, wherein multiple product can be booked on either of said induction units and awaiting discharge to said continuous member.
27. (original) The sortation system in claim 25 wherein said control maintains any booking of transport units for product on one of said induction units notwithstanding variation in speed of said continuous member.

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28. (original) The sortation system in claim 27 wherein said control maintains any booking of transport units for product on one of said induction units notwithstanding a substantial halt in speed of said continuous member.
29. (original) The sortation system in claim 24 wherein said conveying units are closed-loop regulated.
30. (original) The sortation system in claim 24 wherein said conveying units are belt conveyors.
31. (original) The sortation system in claim 24 wherein said conveying units have particular lengths and wherein said induction units are adapted to discharging product to said continuous member having a dimension that is greater than said particular lengths.
32. (original) The sortation system in claim 17 wherein at least one of said induction units follows said continuous member including starting as soon as said continuous member is moving and decreasing in speed only when said continuous member decreases in speed.
33. (original) The sortation system in claim 32 wherein the other of said induction units does not follow said continuous member and can decrease in speed irrespective of said continuous member.

34-57. (cancelled)

58. (original) A sortation system, comprising:
a carousel sorter including a plurality of product carriers arranged in an endless loop;
a plurality of sort destinations for receiving product discharged from said carriers; and
an induction system comprising at least one induction unit having a receiving end for receiving product from a product source and a discharge end for discharging product to said carriers; and

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a control monitoring product on said carriers and booking carriers for product on said induction system, wherein said control is capable of booking carriers irrespective of whether the carriers are already carrying product.

59. (original) The sortation system in claim 58 wherein said control rescinds a booking of a carrier carrying a product if that carrier does not discharge that product to one of said sort destinations prior to arriving at said induction system.

60. (original) The sortation system in claim 58 wherein said at least one induction unit includes a plurality of tandem conveying units between said receiving end and said discharge end, wherein said control books at least one carrier for receipt of product when that product is on one of said conveying units and adjusts relative spacing between product and the respective carrier booked for that product on downstream ones of said conveying units; whereby multiple product can be booked on said at least one induction unit and awaiting discharge to said continuous member.

61. (original) The sortation system in claim 58 wherein said control maintains any booking of transport units for product on said at least one induction unit notwithstanding variation in speed of said continuous member.

62. (original) The sortation system in claim 58 wherein said control maintains any booking of transport units for product on said at least one induction unit notwithstanding a substantial halt in speed of said continuous member.

63. (original) The sortation system in claim 58 wherein said product source substantially excludes product accumulation.

64. (original) The sortation system in claim 58 wherein said product source comprises substantially only belt conveyors.

65. (original) The sortation system in claim 58 wherein said conveying units are closed-loop regulated.

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66. (original) The sortation system in claim 58 wherein said conveying units are belt conveyors.

67. (original) The sortation system in claim 58 wherein said conveying units have particular lengths and wherein said induction units are adapted to discharging product to said continuous member having a dimension that is greater than said particular lengths.

68-82. (cancelled)

83. (original) A method of inducting product to a sorter, the sorter including a continuous member defining a plurality of transport positions of said continuous member and a plurality of sort destinations for receiving product discharged from said continuous member, comprising:

providing at least two induction units, each of said induction units including a plurality of tandem conveying units;

receiving product with each of said induction units from a product source and discharging product from each of said induction units to the continuous member through said merge; and

determining gap between product that will be discharged to said continuous member and at least occasionally discharging product from at least one of said induction units to said continuous member irrespective of gap between product.

84. (original) The method of inducting of claim 83 including decreasing a speed of another of said at least two induction units in response to said at least one of said induction units discharging product to said merge irrespective of gap between product.

85. (original) The method of inducting of claim 84 including performing an activation sequence after decreasing in speed said another of said induction units.

86. (original) The method of inducting of claim 83 including recirculating product discharged to said merge with insufficient gap between the product.

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87.~ (original) The method of inducting of claim 86 including monitoring a proportion of product being recirculated.

88. (original) The method of inducting of claim 87 including discontinuing discharging product to said merge irrespective of gap if the proportion of product in recirculation exceeds a particular level.

89. (original) The method of inducting of claim 83 wherein each of said induction units includes a plurality of tandem conveying units between said receiving end and said discharge end.

90. (original) The method of inducting of claim 83 including booking at least one transport position for receipt of product from either of said induction units.

91. (original) The method of inducting of claim 90 including booking a transport position for a product when that product is at a booking conveying unit and adjusting relative spacing between product and the respective transport position booked for that product on ones of said conveying units downstream of said booking conveying unit.

92. (original) The method of inducting of claim 90 including maintaining any booking of transport units for product on one of said induction units notwithstanding variation in speed of said continuous member.

93. (original) The method of inducting of claim 92 including maintaining any booking of transport units for product on one of said induction units notwithstanding a substantial halt in speed of said continuous member.

94. (original) The method of inducting of claim 83 including closed-loop regulating said conveying units.

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95. (original) The method of inducting of claim 83 wherein said conveying units are belt conveyors.

96. (original) The method of inducting of claim 83 wherein said conveying units have particular lengths and including at least occasionally discharging product to said continuous member having a dimension that is greater than said particular lengths.

97. (original) The method of inducting of claim 83 including following said continuous member with said at least one of said induction units including starting said at least one of said induction units as soon as said continuous member is moving and decreasing in speed said at least one of said induction units substantially only when said continuous member decreases in speed.

98. (original) The method of inducting of claim 97 including at least occasionally decreasing a speed of the other of said induction units irrespective of the speed of said continuous member.

99-120. (cancelled)

121. (original) A method of inducting product to a carrousel sorter including a plurality of product carriers arranged in an endless loop and a plurality of sort destinations for receiving product discharged from said product carriers, comprising:

providing a plurality of tandem conveying units;
receiving product with said conveying units from a product source and discharging product from said conveying units to the product carriers; and
monitoring product on said carriers and booking carriers for product on said conveying units, including at least occasionally booking carriers irrespective of whether the carriers are already carrying product.

122. (original) The method of inducting of claim 121 including rescinding a booking of a carrier carrying a product if that carrier does not discharge that product to one of said sort destinations prior to arriving at said conveying units.

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123. (original) The method of inducting of claim 121 wherein said at least one induction unit includes a plurality of tandem conveying units between said receiving end and said discharge end, further including booking at least one carrier for receipt of product when that product is on one of said conveying units and adjusting relative spacing between product and the respective carrier booked for that product on downstream ones of said conveying units.

124. (original) The method of inducting of claim 121 including maintaining any booking of transport units for product on said at least one induction unit notwithstanding variation in speed of said continuous member.

125. (original) The method of inducting of claim 124 including maintaining any booking of transport units for product on said at least one induction unit notwithstanding a substantial halt in speed of said continuous member.

126. (original) The method of inducting of claim 121 including closed-loop regulating of said conveying units.

127. (original) The method of inducting of claim 121 wherein said conveying units are belt conveyors.

128. (original) The method of inducting of claim 121 wherein said conveying units have particular lengths and including at least occasionally discharging product to said continuous member having a dimension that is greater than said particular lengths.

129. (original) A conveyor induction system, comprising;
a frame including at least two spaced apart supports defining a control compartment between said supports;
a plurality of tandem conveying units supported by said supports;
a computer-based control in said control compartment controlling at least said conveying units; and

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at least one user input control device at said frame for receiving user input for said control.

130. (original) The conveyor induction system in claim 129 including another frame and another plurality of tandem conveying units supported by said another frame, said computer-based control controlling said another plurality of conveying units.

131. (original) The conveyor induction system in claim 130 wherein said another frame includes at least two other supports defining another control compartment between said other supports and output devices in said another control compartment for operating said another plurality of tandem conveying units.

132. (original) The conveyor induction system in claim 129 including a status indicator on said frame for indicating the status of said tandem conveying units.

133. (original) The conveyor induction system in claim 129 wherein each of said conveying units includes a motor, at least two pulleys and a belt, said pulleys supporting said belt and said motor operating at least one of said pulleys, wherein said belt is removable by moving one end of each of said pulleys.